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**Early Operational Art:  
Nathanael Green's Carolina Campaign  
1780-1781**

**A Monograph  
by  
Major Thomas B. Bennett  
Special Forces**



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13. ABSTRACT (Maximum 200 words) <p>THIS MONOGRAPH EXAMINES THE CAROLINA CAMPAIGN CONDUCTED BY NATHANAEL GREENE DURING THE AMERICAN REVOLUTION AND CONTRASTS IT WITH THE CRITERIA DEVELOPED BY DR. ROBERT EPSTEIN AND DR. JAMES SCHNEIDER FOR DETERMINING THE PRACTICE OF OPERATIONAL ART. BOTH DOCTORS ARE PROFESSORS AT THE SCHOOL OF ADVANCED MILITARY STUDIES AND OFFER DIFFERING VIEWS ON WHEN OPERATIONAL ART WAS FIRST PRACTICED. HOWEVER, GREENE EXECUTED HIS CAMPAIGN PRIOR TO WHEN EITHER WOULD ARGUE OPERATIONAL ART FIRST ORIGINATED AS A DISTINCT LEVEL OF WAR.</p> <p>THE MONOGRAPH BEGINS WITH AN EXAMINATION OF DR. EPSTEIN'S AND DR. SCHNEIDER'S THEORIES. IT THEN DISCUSSES THE CONDUCT OF GREENE'S CAMPAIGN AND RELATES HIS ACTIONS TO THE THEORETICAL FRAMEWORKS ESTABLISHED BY THE TWO PROFESSORS. AFTER CONTRASTING GREENE'S CAMPAIGN WITH THEIR THEORIES, THE MONOGRAPH CONCLUDES THAT GREENE'S CAMPAIGN SATISFIES THEIR CRITERIA AND THUS PROVIDES AN EXAMPLE OF EARLY OPERATIONAL ART. LASTLY, THE MONOGRAPH PROVIDES AN ANALYSIS OF THE EFFICACY OF USING THEORETICAL FRAMEWORKS TO FURTHER THE STUDY OF OPERATIONAL ART.</p>				
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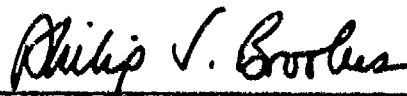
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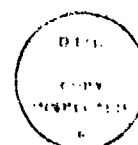
# ABSTRACT

EARLY OPERATIONAL ART: NATHANAEL GREENE'S CAROLINA CAMPAIGN 1780-1781 by Thomas Bennett, USA, 49 pages.

This monograph examines the Carolina Campaign conducted by Nathanael Greene during the American Revolution and contrasts it with the criteria developed by Dr. Robert Epstein and Dr. James Schneider for determining the practice of operational art. Both doctors are professors at the School of Advanced Military Studies and offer differing views on when operational art was first practiced. However, Greene executed his campaign prior to when either would argue operational art first originated as a distinct level of war.

The monograph begins with an examination of Dr. Epstein's and Dr. Schneider's theories. It then discusses the conduct of Greene's campaign and relates his actions to the theoretical frameworks established by the two professors. After contrasting Greene's campaign with their theories, the monograph concludes that Greene's campaign satisfies their criteria and thus provides an example of early operational art. Lastly, the monograph provides an analysis of the efficacy of using theoretical frameworks to further the study of operational art.

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## SECTION 1: INTRODUCTION

The United States Army has recognized operational art as a distinct level of war linking tactics with strategy. Although it has presumably been practiced to one extent or another for quite some time, it has only recently been added to the army's lexicon. Previously, operations were fit into the realm of strategy or tactics.

FM 100-5 defines operational art as "the employment of military forces to attain strategic goals in a theater of war or theater of operations through the design, organization, and conduct of campaigns and major operations".<sup>1</sup> It explains that strategic aims such as the control of a geographical area, reestablishment of political boundaries or the defeat of an enemy force in a theater of operations are the long-term goals of campaign plans.<sup>2</sup> It further states that the objective of offensive campaigns is to retain the initiative, to strike enemy weakness, and to attack in great depth. Conversely, defensive campaigns may consist of fighting a series of inconclusive battles to resist and wear down the enemy or of drawing the enemy deep into friendly territory to exhaust and overextend him.<sup>3</sup>

These rather broad concepts would seem to apply to innumerable campaigns throughout the history of

warfare. However, at the School of Advanced Military Studies (SAMS), which focuses on the study of operational art, students are presented with two opposing views on the origins and evolution of operational art.

Dr. James Schneider, author of the SAMS "Foundation of Military Theory" Course, and Dr. Robert Epstein, author of the SAMS "Historical Practice of Operational Art" Course, have developed opposing theories describing how operational art emerged as a distinct level of war during certain specific and quite different eras. Dr. Schneider contends that its origins are in the American Civil War while Dr. Epstein maintains that its beginnings are in the campaigns of Napoleon. As one might expect of scholars specializing in the analysis of military history, both present their arguments in a very erudite manner. Which argument, if either, is correct?

Nathanael Greene's Carolina Campaign of 1780-1781 is but one of many campaigns studied during the SAMS school year. When reviewing the events of the campaign, it appears that Greene was indeed conducting what we today would term operational art. This is especially true using the broad concepts contained in FM 100-5 which does not impose a start date for the practice of operational art. Unfortunately, according to Schneider

and Epstein, Greene could not have been a practitioner of operational art since it had not yet emerged.

Both professors have written extensively on the subject of operational art and have established certain criteria or characteristics for what constitutes its practice. The purpose of this monograph is to contrast Greene's campaign with those criteria in order to determine if Greene was conducting operational art in accordance with their theses. The monograph begins with an analysis of Epstein's and Schneider's theories. Then it will discuss the conduct of Greene's campaign and relate his actions to the theoretical frameworks established. Finally, the monograph will draw conclusions as to whether or not Greene's campaign was operational art. In addition, the monograph will provide an analysis of the efficacy of using these theoretical frameworks to further the study of operational art.

## SECTION 2: THE ORIGINS OF OPERATIONAL ART

Schneider and Epstein have written, argued, and lectured on the origins of operational art for both theoretical and educational purposes. In order to understand their positions, it is necessary to review their theories and present the criteria they use to



judge operational art in historical practice.

### Epstein's Thesis

Epstein's theory is that operational art emerged as a result of the dissolution of unitary armies during the Napoleonic era. He divides the warfare conducted from 1792-1815 into three distinct phases: the laying of the foundations of Napoleonic warfare, 1792-1805; its emergence and years of dominance, 1805-1807; and the restoration of military balance, 1809-1815.<sup>4</sup> He contends that the warfare of 1809-1815 has more similarities than dissimilarities with the wars of 1861-1871. He sees more of a "blending of characteristics rather than a clear break".<sup>5</sup>

Napoleon systematized the concept of the army corps which enabled large self-contained units to advance over different routes for the purpose of shaping a decisive battle. This was the first time that armies did not move as unitary formations. Epstein contends that this, in a sense, is when the operational level of war was developed and practiced.<sup>6</sup>

Epstein theorizes that the creation of the army corps enabled the operational approach and is the characteristic that runs as a unifying theme through the military history of the nineteenth century.<sup>7</sup> The army corps allowed a new operational deployment, *distributed maneuver*. Armies could maneuver their corps

over fronts of a hundred miles and in accordance with an overall campaign plan.<sup>8</sup> Epstein also notes that the corps system provided armies with resilience, a characteristic he attributes to modern armies.<sup>9</sup>

Epstein explains that those who favor the American Civil War as the start point of modern operational art are impressed by the indecisiveness of the battles. This indecisiveness resulted due to the symmetrical relationship which existed between the rival armies. Quick victory became impossible and the Confederacy had to be worn down through attrition.<sup>10</sup> This same indecisiveness appears in the Napoleonic Wars after the armies were similarly organized, recruited, and equipped. This symmetry first appeared in the Franco-Austrian War of 1809.<sup>11</sup> The decisive victories of the French Army from 1805-1807 were only possible because this symmetry had not yet occurred.

Epstein contends that great victories result only when there is an asymmetrical relationship between rival armies. The lesson of 1809 is that when armies are evenly matched, protracted war ensues.<sup>12</sup> Consequently, operational art, the linking of battles into campaigns to achieve the strategic aims, becomes necessary.

This war was dramatically different from the previous Napoleonic Wars because Austria had modernized

her army which resulted in a contest between equally matched opponents. One of the most significant changes instituted by the Austrians was the adoption of the army corps system which added structural resiliency and tactical flexibility.<sup>13</sup> War no longer consisted of a single decisive victory but of the cumulative impact of a series of related operations. Victory was determined by attrition and the side with the greatest strategic resources won.<sup>14</sup> Also during this contest, concern for security away from the fighting fronts came to the fore. Combat was conducted in the rear as well as the front.<sup>15</sup> Thus, Epstein notes that the armies of 1809 produced modern operations, or operational art, if defined as "continuous and sequential engagements conducted by distributed maneuver and carried throughout the depth of a theater of operations".<sup>16</sup>

Epstein explains that it was the army corps system that allowed the French and Austrian armies to conduct distributed maneuver. Its effect was a form of mobile operations in which decentralized command and control was essential. The tactical abilities of subordinate commanders who could act on their own initiative according to flexible mission-type orders determined victory or defeat.<sup>17</sup> The corps system also provided both sides with the ability to tap the resources of their states which made their armies more resilient and less

likely to collapse after a single lost battle. Victory became the product of successive battles and engagements rather than the result of one decisive battle as in the "old days".<sup>13</sup>

Epstein concludes that the American Civil War was not the first war consisting of indecisive battles. He sees the latter Napoleonic Wars as similar to the American Civil War: both were protracted and the side with the greater strategic resources won by attrition.<sup>14</sup> He notes that:

...throughout history it was not always possible to eliminate the opposing army in one blow and so often a series of blows, cumulative in effect, were needed to achieve the strategic objective--the destruction of the enemy's armed forces. The process to achieve this goal is what we call operational art.<sup>15</sup>

To summarize, Epstein contends that operational art emerged with the adoption of the army corps structure during the Napoleonic era which allowed distributed maneuver over large areas and resulted in indecisive battles. This indecisiveness required a series of battles throughout the depth of a theater of operations resulting in wars of attrition.

Unfortunately, Epstein does not provide a specific list of attributes required for the conduct of operational art. However, dispersed in his writings are characteristics or elements of operational art which he deems essential for its practice. It is these elements

which will be outlined next and will form the basis for contrasting Greene's campaign with Epstein's theory.

First is his discussion on the indecisiveness of battles under the operational paradigm. He explains that operational art is the process to achieve the strategic objective of destroying the enemy's armed forces. Under the operational paradigm, this results from the cumulative effect of a series of related operations rather than a single decisive victory.<sup>21</sup> This implies and includes the concept of combat in rear areas, the resiliency of formations, and the necessity for decentralized command and control.

Second, Epstein finds the Clauswitzian concept of center of gravity essential. He notes that "identifying and opposing the enemy's center of gravity while effectively using one's own is vital for an operational commander".<sup>22</sup> He deems defeating the enemy center of gravity by bringing strength against weakness as a major element of operational art. This can be done by attacking decisive points which directly or indirectly overthrow the center of gravity.<sup>23</sup>

Third, Epstein explains that the Jominian concept of lines of operation is crucial in designing a campaign plan. This concerns where to direct one's armed forces for the purpose of creating a favorable battle situation for defeating an enemy force or

securing physical objectives that render him powerless.<sup>24</sup>

Last, Epstein explains that the real test and essence of operational art is knowing when to mix offensive and defensive elements as part of a workable plan. Further, the operational artist must know when to cede the initiative to the enemy and when to wrest it back again. The operational practitioner must know "when to hold his inclination in check and pick his own time and place for the decisive reponse".<sup>25</sup>

Dr. Schneider does not concur with Epstein's thesis. He argues that operational art began later, namely during the American Civil War.

#### Schneider's Thesis

Schneider's thesis is that operational art began during the American Civil War, specifically with Grant's campaign in 1864. He contends that Napoleon's employment of several corps in distributed maneuver merely anticipated operational art. He argues that in the final analysis, Napoleon must be viewed as the last great practitioner of the classical "strategy of a single point".<sup>26</sup>

Mass and concentration characterized Napoleonic warfare. Armies consisted of only one force to maneuver, which rendered impossible the development of the complex combinations of maneuver characteristic of

modern operational art.<sup>27</sup> According to Schneider, only the seed of operational art was contained within the Napoleonic style of warfare. This seed was the corps system which allowed armies to move dispersed.<sup>28</sup>

Schneider explains that the integration of temporally and spatially distributed operations into one coherent whole is the hallmark of operational art.<sup>29</sup> Further, he asserts that simultaneous and successive operations are, in fact, the heart of operational art and that this idea was alien to the Napoleonic style of warfare and to its predecessors.<sup>30</sup> Classical strategists used the medium of the concentrated battle while the modern operational artist uses the medium of the distributed operation.<sup>31</sup>

Although he moved his armies dispersed, Napoleon was not an operational artist because he concentrated for battle and the outcome of the war could be decided in one afternoon. Over time, weapon lethality caused the expansion of the concentrated forces in a theater (both length and depth), which meant that a campaign could no longer be decided by one decisive action.<sup>32</sup>

It is during the American Civil War that these changes in warfare occurred and where we begin to glimpse the characteristics that would eventually define operational art.<sup>33</sup> During this war the classical strategy of a single point became extended in breadth

and depth through space and time under the new style of operational art.<sup>34</sup> A new symmetry characterized by the distribution of forces in a theater of operations replaced the old classical symmetry characterized by the concentration of forces in a theater of operations.<sup>35</sup> Schneider explains that extended maneuver and deep battle defines operational art and that it is the distribution of forces that causes the change in classical strategy and the emergence of operational art.<sup>36</sup>

Schneider defines operational art as "the creative use of distributed operations for the purpose of strategy".<sup>37</sup> He defines a distributed operation as "a coherent system of spatially and temporally extended relational movements and distributed battles, whether actual or threatened, that seek to seize, retain or deny freedom of action".<sup>38</sup>

Freedom of action is a key concept in Schneider's thesis. He asserts that battles were waged to destroy the enemy's army under the classical paradigm and that the purpose of maneuver was to maximize the concentration of force to achieve a decisive positional advantage for the onset of battle.<sup>39</sup> Conversely, battles are fought to retain or deny freedom of action under the new operational paradigm and the purpose of operational maneuver is to maximize the flow of force



in tempo and density.<sup>40</sup> He defines operational maneuver as "relational movement in depth that maximizes freedom of action for the destruction of the enemy's capacity to wage war".<sup>41</sup>

In "The Loose Marble--and the Origins of Operational Art", Dr. Schneider asserts that the operational art of the American Civil War could be distinguished from the strategy of a single point by twelve discriminating characteristics.<sup>42</sup> He further refines this list in "Vulcan's Anvil: The American Civil War and the Emergence of Operational Art" where he describes it as the structure through which operational art is manifested in its fullest expression.<sup>43</sup> The eight attributes Schneider deduced were all impossible prior to the arrival of the Industrial Revolution, particularly the introduction of the railroad and telegraph. These attributes are outlined below and will form the basis for evaluating the extent to which Greene's campaign satisfies Schnieder's structure.

#### Schneider's Structure of Operational Art

1. THE DISTRIBUTED OPERATION: Schneider deems this the basic building block of operational art. He describes the distributed operation as an ensemble of deep maneuvers and distributed battles extended in space and time but unified by the common aim of retaining or

denying freedom of action.<sup>44</sup> He asserts that the Army of the Potomac's advance after the Battle of the Wilderness was the first time an army executed multiple deep maneuvers and distributed battles for the sake of freedom of action rather than for the purpose of positional advantage and annihilation.

2. THE DISTRIBUTED CAMPAIGN: Schneider asserts that a distributed campaign may consist of only a single operation. However, in its fullest expression, operational art is characterized by the integration of several simultaneous and successive distributed operations in a campaign.<sup>45</sup> As the distributed operation emerged and replaced the classic battle of annihilation as the primary form of destruction, distributed campaigns developed an orientation toward geography and terrain and away from the enemy army. Battles and maneuver resulted in distributed campaigns being inherently exhaustive.<sup>46</sup> Schneider uses the example of Grant's 1864 campaign in which he used the distributed operations of Sherman, Banks, Sigel, Meade, and Butler to achieve his ends.

3. CONTINUOUS LOGISTICS: Schneider explains that the logistics system of a modern industrial army must be continuous if it is to maintain a militarily effective presence. The railroad and the mechanization of the factory allowed this to evolve.<sup>47</sup> The railroad proved

key to providing continuous supply and movement of large formations. He further asserts that it was precisely because of the continuous arterial nature of operational logistics that protracted battles and operations could be conducted at all.<sup>48</sup>

4. INSTANTANEOUS COMMAND AND CONTROL: Schneider explains that the distributed forces under the operational paradigm create a greater variety of unexpected possibilities which generates greater information, the basis of decisions. The operational commander is thus confronted with many decisions and must have an instantaneous means of communication in order to adjust his distributed forces and counteract the unexpected actions of the enemy.<sup>49</sup>

5. THE OPERATIONALLY DURABLE FORMATION: Schneider explains that operationally durable formations are "capable of conducting indefinitely a succession of distributed operations".<sup>50</sup> Continuous logistics and instantaneous communications aided in their creation. Prior to Napoleon the main field force was the primary formation that was tactically durable. Later, the corps was tactically durable (could fight independently for a day). The field army emerged during the American Civil War as an "operationally" durable formation according to Schneider's thesis.<sup>51</sup>

6. OPERATIONAL VISION: Schneider explains that,

characteristically, operational artists have a unified and holistic approach in the design, execution, and sustainment of campaigns. This results from an intuitive ability to ascertain the true state of affairs in their theater of operations.<sup>52</sup>

7. THE DISTRIBUTED ENEMY: Schneider asserts that the operational system evolved most effectively against a similarly designed opponent. He uses the analogy of an operational artist being a sculptor and the opponent constitutes the "stone" upon which the operational artist performs his creative work. Further, that "armed with the 'chisel' of the distributed operation, such a system can sculpt its way into an extended army".<sup>53</sup>

8. DISTRIBUTED DEPLOYMENT: Schneider explains that as the defense of key resources and industrial areas grew in importance, deployment patterns and force posture had to take this into consideration. Commanders could no longer view dispersion simply as a necessary evil. The Industrial Revolution resulted in the army and terrain having a closer association than ever before.<sup>54</sup>

To summarize, Dr. Schneider views the origins of operational art to be during the American Civil War. Prior to that time armies conducted the "strategy of a single point" which did not allow the fruition of operational art as defined by the eight attributes that he developed. Therefore, Schneider asserts that

operational art was not possible prior to the advent of the Industrial Revolution.

The theories of operational art put forth by Schneider and Epstein are in basic agreement as to how operational art is defined. However, their main points of when and why operational art emerged as it did give two different academic viewpoints. Both go beyond the concepts contained in FM 100-5 by narrowly defining operational art to prove their point. Both would agree that Greene could not have been conducting operational art in his Carolina Campaign of 1780-1781. However, even using their criteria, a case can be made that operational art existed previous to when Schneider and Epstein argue it emerged. The next section will contrast their criteria with Greene's campaign. How well the campaign meets their models should tell something about the campaign and the validity of using such theoretical frameworks.

### SECTION 3: ANALYZING THE CAMPAIGN

By September 1780, the revolution in the southern colonies was not progressing well. In May, Sir Henry Clinton, in cooperation with the Royal Navy, had captured the main Revolutionary Army in the south at Charleston after its commander, Major General Benjamin

Lincoln, had been persuaded by civilian authorities to keep his army in the city.<sup>55</sup> A few days later, a Revolutionary cavalry command was defeated by Colonel Banastre Tarleton's British and Loyalist Legion near Waxhaws causing organized resistance in the Carolinas to become almost extinct.

The Continental Congress sent Major General Horatio Gates south in hopes of stabilizing the situation. Instead, he elected to do battle against the British, now under Lord Cornwallis, and was defeated at Camden on August 16, 1780. Two days later, Tarleton conducted a surprise attack on a Revolutionary militia force commanded by Thomas Sumter at Fishing Creek. The attack killed and wounded more than 450 and scattered the rest of the force. The Revolutionary cause seemed even more hopeless than before.<sup>56</sup>

The Congress now heeded Washington's advice and sent Major General Nathanael Greene to command the Southern Department. Greene had proven to be one of Washington's ablest lieutenants, having fought in nearly every major engagement in the north and having served most recently as the army's quartermaster general. Washington did not feel the need to provide Greene with specific instructions. Instead, he told him to use his own prudence and judgement in the circumstances in which he found himself.<sup>57</sup>

Greene realized that in order to achieve the Revolutionary goal of gaining complete independence from England he would have to regain control of the population and the countryside. This necessitated the destruction of the British regular forces under Lord Cornwallis. Without this force, the scattered British and Loyalist posts would be untenable and the British would eventually lose control of the countryside. Throughout the campaign, Greene remained focused on this goal or on what we today would refer to as the British operational center of gravity. Epstein notes that identifying the center of gravity is essential and without actually saying so, Greene appears to have identified a center of gravity and focused on its destruction.

Greene's early planning also satisfies Schneider's criterion of operational vision which he refers to as a "unified and holistic approach in the design, execution, and sustainment of campaigns".<sup>53</sup> Greene knew he had meager resources available with which to work. He determined that until he could train a regular army, partisan operations would have to suffice. Later, partisan forces would operate in cooperation with the regular army in forcing the British and Loyalist forces to concentrate or risk being destroyed piecemeal. This would then encourage the militia to come forward and

protect the population from the depredations of the enemy. Greene felt that this was the best use of scarce resources and the best way to maintain the revolution.<sup>59</sup>

Greene gathered the remnants of Gates' command at Cheraw, near the border of the two Carolinas, and began the task of rebuilding the Continental Army in the South. When he felt ready, he divided his badly outnumbered command of a little over a thousand men into three parts. He sent Brigadier General Daniel Morgan with approximately 600 men west to operate in the vicinity of Ninety-six on the British left flank and rear. Lieutenant Colonel Henry Lee with approximately 280 men moved east to cooperate with the partisan Francis Marion in interdicting British supply lines along the coast. A few hundred men remained with Greene in the center to observe British movements from Charleston.<sup>60</sup>

These force dispositions satisfy Schneider's criterion of the distributed operation which he describes as the basic building block of operational art. Greene's separated forces, extended in space and time, resulted in distributed battles throughout the theater of operations. Greene's regular forces provided the partisans freedom of action by ensuring the British could not disperse sufficiently to seek and destroy them. Meanwhile, partisan operations against British



lines of communication provided Greene's regular army with freedom of action by forcing the British to siphon manpower for their defense. This prevented them from engaging Greene with overwhelming superiority.<sup>61</sup>

Because of the division of Greene's forces, Morgan and Marion were in the position of threatening British outposts and destroying Loyalist forces in Cornwallis' rear. Epstein notes that during the Franco-Austrian War of 1809, security away from the fighting fronts gained in importance since combat was conducted in the rear as well as the front (throughout the depth of a theater of operations). Greene's ability to conduct combat throughout the depth of the theater preceded the War of 1809 by almost thirty years. The British were forced to use large armed escorts to provide security to their resupply efforts which drained manpower from forces available to maintain control of the countryside.

By conducting operations throughout the depth of the theater, Greene was also adhering to his operational vision of employing regular, militia, and partisan forces to destroy Cornwallis' army. Greene also knew Cornwallis would be tempted to similarly divide his command which would make him more susceptible to partisan harassment and piecemeal encounters with Greene's regular army.<sup>62</sup>

As Morgan advanced on Ninety-six, Cornwallis

became aware that if Morgan seized the post, all of western South Carolina may well rise in rebellion. Greene, Lee, and Marion could conceivably threaten Charleston if Cornwallis led his entire force against Morgan. Accordingly, Cornwallis decided to divide his own force, keeping half of it to watch Greene while the other half, under Tarleton, moved west to strike at Morgan.<sup>63</sup>

Tarleton began his pursuit of Morgan on January 6, 1781. When Morgan and Greene became aware of the British design they decided to concentrate their forces. Morgan began moving his forces toward the Broad River for a link-up with Greene. By nightfall on January 16, Morgan was still six miles from the crossing site. Tarleton had pushed his force hard and was less than ten miles away. Morgan, realizing that Tarleton was beyond the support of Cornwallis, decided to give battle. The next day at a place called Cowpens, Morgan nearly annihilated Tarleton's British regulars. Tarleton himself barely escaped with some of his dragoons while losing some nine-tenths of his men in killed and wounded.<sup>64</sup> The loss of Tarleton's command was a major blow to Cornwallis. Even before the loss, he had grown nervous about his divided forces and, after receiving 1500 reinforcements from Clinton's northern army, was on the march to rejoin forces with Tarleton.

He now decided to hasten toward Morgan in hopes of destroying his force before it could unite with Greene's.<sup>65</sup>

Cornwallis, assuming Morgan would rest after his Cowpens victory, sent his army in that direction. Morgan, however, did not pause but instead hastened to rejoin Greene. When Cornwallis learned of his error, he angrily ordered his army to destroy all impediments to a swift march--tents, all wagons except a few for ammunition and hospital stores, and all rations except what could be carried on their backs--and set out chasing the rebels. When Greene learned of Cornwallis' actions, he is quoted as saying "Then he is ours".<sup>66</sup>

Schneider's criterion of continuous logistics impacts the campaign at this point. He asserts that a logistics system must be continuous in order to maintain a militarily effective presence. Without operational logistics, an army would "evaporate".<sup>67</sup> It will become apparent that, indeed, this nearly occurred with Cornwallis' army while the logistics preparations of Greene provided him a significant advantage.

When Greene took command of the Southern Army, he replaced his quartermaster with the young and reliable Colonel Carrington who assisted in establishing a reliable commissary and transport system. He also established over twenty supply magazines throughout his

rear area with up to two days of supply at each. Additionally, he ordered the construction of 100 large batteaus to ensure the numerous rivers throughout the theater could be traveled rapidly.<sup>68</sup> Admittedly, the fact that three scattered detachments could subsist more easily than one concentrated force played a part in Greene's initial decision to divide his forces.<sup>69</sup> However, Greene could apparently break the classical mindset of concentrating force. Separated forces were more supportable logistically and Greene made appropriate preparations to ensure that his army would not evaporate. Not only did Greene provide continuous logistics, he also showed an operational vision encompassing all aspects of his campaign.

Meanwhile, Greene was determined to ensure that Cornwallis' force did evaporate. Following the victory at Cowpens, Greene recalled Lee from Marion's force and instructed all partisan units to converge and "close the country" on the advancing Cornwallis.<sup>70</sup> Greene concentrated on leading Cornwallis on as long of a chase as possible in order to exhaust the British army. This chase would extend across the numerous rivers of the Carolinas and into Virginia if need be. Greene's building of batteaus and establishment of supply magazines would now pay dividends.

Cornwallis drove his men thirty miles a day in

bitter winter weather in an attempt to overcome the withdrawing Revolutionaries before they reached the Dan River and the relative safety of Virginia. Often, Greene's rear guard barely escaped destructive surprise attacks at the hands of Cornwallis' advance guard led by the vengeance-minded Tarleton. During the withdrawal, partisans continuously interdicted Cornwallis' lines of supply, further degenerating the British army's means to subsist. Always, Greene just managed to stay out of Cornwallis' reach.

On February 14, the Americans escaped in waiting boats across the Dan River barely ahead of the hard driving British who had covered forty miles in the last twenty-four hours. Cornwallis' men reached the Dan River completely exhausted. Of the original force of 2500, 500 had dropped along the wayside. Haversacks were empty and partisans continued to cut supply lines.<sup>11</sup> Epstein noted that combat in rear areas is a characteristic of operational art. Throughout the withdrawal, Greene skillfully employed partisans in the British rear to disrupt supply lines and hasten the exhaustion of Cornwallis' army.

Greene's conduct of the withdrawal also satisfies Schneider's attribute of instantaneous command and control which he asserts is necessary for the adjustment of distributed forces and to counteract the

unexpected actions of the enemy. He contends that Grant had this ability during his campaign of 1864 due to the technological breakthrough of the telegraph. However, it is doubtful that even Grant had available to him at all times a system of instantaneous command and control. Orders still sometimes required days for acknowledgement. Grant did not possess instantaneous command and control in a literal sense but he did in a conceptual sense. That is, his communications were timely. He was capable of reacting to what Schneider refers to as the variety of unexpected possibilities in a timely manner.

Greene's withdrawal demonstrates that he too was able to react to events in a timely and effective manner. When Cornwallis began his pursuit, Greene ordered several of his partisan forces to change their areas of operations and converge on the rear areas of Cornwallis' advancing army in order to hasten its exhaustion. They were able to accomplish this in a timely manner and significantly aided Greene in the conduct of his withdrawal. Using the means available for the day and age, just as Grant had done, Greene was able to relay orders to subordinates changing their dispositions and redirecting their efforts; all in a timely manner. In this respect, Greene's use of communications satisfies Schneider's concept.

After crossing the Dan River, Continental recruits along with Virginia and North Carolina militia swelled Greene's numbers to about 4300. Meanwhile, Harry Lee's force ambushed and massacred 400 Loyalists near the Haw River who were attempting to reinforce Cornwallis. Greene's force now more than doubled Cornwallis' 2000.

Greene realized that Cornwallis had reached his culmination point and the conditions for success had been established. It was now possible to achieve his strategic aims with a tactical battle. The destruction of Cornwallis' army, the British center of gravity in the south, would facilitate Greene's ability to defeat the scattered British garrisons in South Carolina relatively unimpeded. Therefore, on the theory that he could hardly lose and that even if he did, further losses would cripple the British, Greene decided to give Cornwallis his battle.<sup>11</sup>

Epstein stresses the importance of the Jominian lines of operation, where to direct one's armed forces for the purpose of creating a favorable battle situation. While withdrawing, Greene's intent was to entice Cornwallis into following and to exhaust himself in the process in order to provide the Revolutionaries with a favorable battle situation. As Greene withdrew, he knew he was falling back on his base of operations and shortening his lines while Cornwallis was

stretching his. Upon reaching the Dan, Greene now had the advantage of both interior and exterior lines. His army operated on interior lines by being closer to the separate enemy forces than they were to each other and he could shift his force laterally much more rapidly. Conversely, his partisan forces provided the benefit of exterior lines. By operating freely in the rear, they offered the opportunity to encircle and ensure the destruction of the enemy.<sup>73</sup>

On the above premise, Greene recrossed the Dan River to meet Cornwallis. While Lee fixed Tarleton's advance guard in place, Greene deployed in battle formation at Guilford Court House. Here, Greene satisfies what Epstein labels the real test and essence of operational art: knowing when to mix offensive and defensive elements as part of a workable plan. Throughout the withdrawal Greene had been on the operational defensive in hopes of exhausting the British. Simultaneously, his partisans were operating offensively to interdict supply lines and reinforcements. Upon recrossing the Dan River, Greene assumed the operational offensive but positioned his force where he could fight using the benefits of the tactical defense.<sup>74</sup> As Epstein asserts, he knew when to hold his inclination in check and pick his own time and place for the decisive reposte.



Although now outnumbered, Cornwallis had confidence in his veterans and knew that if he withdrew he would suffer continual harassment from Greene's partisans. Accordingly, he decided to attack. The four hour battle at Guilford Court House was one of the hardest fought of the Revolution. The Americans fought respectably but eventually conducted a disciplined withdrawal. In winning the battlefield, Cornwallis paid a devastating price. Over one third of his 2000 strong force was either killed, wounded, or captured. He could not risk another attack, another tactical victory could completely destroy him. Indeed, Greene had ruined Cornwallis' army as an effective fighting force while suffering less than 300 casualties.<sup>75</sup>

Without adequate supply and with partisans preventing any foraging, Cornwallis elected to retreat. He could withdraw the 150 miles to the British outpost at Camden but with Marion and Sumter operating in the area beyond the Pee Dee River and Greene pursuing, he could well be annihilated. Instead, he elected to withdraw the two hundred miles to Wilmington where British sea power could replenish his force. In effect, he left the entire defense of the Carolinas to the British force at Camden and the small, scattered garrisons which had been established to keep the countryside pacified.<sup>76</sup>

Greene had indeed created a favorable battle situation. By assuming an operational offense and tactical defense, he had ruined Cornwallis' army. The actions of Greene's forces throughout the operation also satisfy Schneider's attribute of the operationally durable formation. Greene and his partisan commanders' ability to protect and wisely employ their respective forces resulted in tactically durable formations. Their aggregate resulted in an operationally durable formation. Indeed, in accordance with Schneider's concept, Greene's forces proved capable of conducting a succession of distributed operations. His partisans and militia forces under Morgan (until he rejoined Greene), Lee, and Marion continually operated on the flanks and rear of the British from the initial division of the army. Meanwhile, the main army conducted a lengthy withdrawal, participated in a major battle, and now prepared to re-enter South Carolina to continue operations. To date and through the remainder of the campaign, Greene's army would demonstrate the durability emphasized by Schneider and the resiliency expressed by Epstein by fighting and often losing tactical confrontations but always remaining capable of continuing their operations.

Greene's next actions satisfy Schneider's attribute of the distributed campaign which he asserts

characterizes operational art in its fullest expression. It also satisfies Dr. Epstein's assertion that under the new operational paradigm wars consist of the cumulative impact of a series of related operations.

The events of January through March 1781 constitute the first operation of Greene's campaign to destroy the British presence in the South. Cornwallis' retreat to Wilmington following his ruinous victory at Guilford Court House ended the first operation of the campaign. Cornwallis' army was no longer an effective fighting force and had no impact on the remainder of the campaign. In essence, the British operational center of gravity had been destroyed and it was only a matter of time before the Americans achieved their strategic goals in the South. With the main army under Cornwallis impotent, Greene could now focus his attention on the second operation of the campaign: reconquering South Carolina by seizing the scattered British garrisons located there.<sup>11</sup> Concurrently with the operations of his regular army, Greene's partisan and militia forces would continue conducting operations on the periphery.

The British still had about 8000 soldiers located in South Carolina but they were scattered in garrisons from Charleston to Ninety-six to keep the countryside

pacified. When they had formed the garrisons they could afford to disperse because there was only minimal partisan resistance and no American army existed which could threaten them. Now, Greene was arriving and it was Cornwallis who was busy licking his wounds.

Greene chose the post at Camden under Lieutenant Colonel Lord Rawdon as his first target. This garrison, by virtue of its location, controlled communications between Charleston and the west. Greene knew that even if Cornwallis attempted to interfere, he would arrive too late. As it was, Cornwallis elected to make his next moves in Virginia, consoling himself that this was the real heart of the rebellion. His departure left Rawdon in command of all British forces in South Carolina.<sup>78</sup>

Upon arrival at Camden, Greene halted to await reinforcements prior to attacking Rawdon's strong defensive works. However, Rawdon elected to move out from behind his defenses and conduct a surprise attack on Greene. He did so at Hobkirk's Hill on April 25. Again, the British could claim tactical victory by driving the Americans from the battlefield but Rawdon's losses were so severe that he deemed it necessary to withdraw from Camden. He also ordered the evacuation of Ninety-six and Fort Granby in order to collect from those outposts an army capable of handling Greene.<sup>79</sup>

While Greene had been advancing on Camden, he had ordered Marion (temporarily rejoined by Lee) to interdict British communications between Charleston, Camden, and Ninety-six; Sumter to isolate Camden from the west; and Pickens to move on Augusta. As Greene was battling Rawdon at Hobkrik's Hill, Marion and Lee were capturing Forts Watson and Motte nearer the coast and Pickens surrounded Augusta. Rawdon's order to evacuate Fort Granby fell into partisan hands and Lee was able to capture that garrison also. Meanwhile, Sumter was taking another outpost at Orangeburg. Later in the campaign, while Greene moved against Ninety-six, Marion took Georgetown and the combined forces of Pickens and Lee took Augusta.<sup>80</sup>

This provides another example of Schneider's attribute of the distributed campaign. He uses as an example Grant's campaign in 1864 in which he used the distributed operations of Sherman, Banks, Sigel, Meade, and Butler to achieve his goals. Here, Greene used the distributed operations of his army and the forces of Marion, Sumter, Picken, and Lee to achieve his operational end.

These force dispositions also satisfy Epstein's assertion that decentralized command and control is essential when conducting distributed maneuver. Green's successes resulted from the ability of his subordinate

commanders to act on their own initiative according to flexible mission-type orders. Early in the campaign, Greene provided his partisan leaders with general orders to concentrate on interdicting British lines of supply in specific areas of operations. Later, in South Carolina, he directed them to attack outlying British outposts in concert with the actions of his main army. At all times, he relied on the initiative and cunning of his subordinate commanders.

The British strategy in South Carolina also provides us with an example of Schneider's attribute of the distributed enemy, which he describes with the analogy of the sculptor. The British had developed a strategy of posts to pacify the countryside and counter the partisan threat. However, their posts had never been strong enough to really pacify the country and partisan attacks on smaller garrisons forced the British to consolidate into fewer and larger garrisons. Unfortunately, the larger posts were too few to control partisan activities and not strong enough to withstand the attack of a relatively strong field force.<sup>81</sup> This allowed Greene, "armed with the chisel of the distributed operation" to "sculpt" his way into his extended enemy.

British strategy in the South also allowed Greene to satisfy Schneider's attribute of distributed

deployment. Schneider explains that the Industrial Revolution resulted in a close association between the army and the terrain. Deployment patterns had to take into account the defense of key resources and industrial areas. Greene's operational goal was the reconquest of the South which necessitated wresting control of the countryside from the British. The countryside itself, to include its populace, was indeed a key resource. Accordingly, and in response to British dispositions under their strategy of a war of posts, Greene distributed his forces throughout the theater in order to regain and then defend the countryside. This close association with the terrain, albeit for different reasons than Schneider suggests, resulted in Greene's distributed deployment.

Following his defeat at Hobkirk's Hill, Greene advanced on Ninety-six. This provides another example of Schneider's attribute of the distributed operation, the goal of which is freedom of action. Schneider asserts that the Army of the Potomac's advance after the Battle of the Wilderness was the first time an army conducted multiple deep maneuvers and distributed battles for the sake of freedom of action rather than for the purpose of positional advantage and annihilation. However, in South Carolina, Greene did likewise. Additionally, the presence of Greene's army

provided the partisans with freedom of action by ensuring the British and Loyalist forces could not disperse sufficiently to run them into the ground.

Following the evacuation of Ninety-six by the British, the post was manned by a garrison of about 550 Loyalists under Lieutenant Colonel John Cruger. This force was strong enough to compel Greene to conduct a formal siege which he handled badly by pressing the vital points too little and too late.<sup>82</sup> Meanwhile, Rawdon had received reinforcements from England and could field an army of 2000 men with which he hastened from Charleston to relieve Nine-six. When Rawdon neared, Greene pulled away in hopes of repeating his race to the Dan River. Rawdon pursued Greene to the Enoree River but when Greene raced across the Tyger and the Broad toward Charlotte, Rawdon broke off the chase. He had learned from Cornwallis' folly.<sup>83</sup> Rather than risk a similar evaporation of his army, he marched back toward the coast realizing that unless he could bring Greene to battle and win a decisive victory, the Revolutionaries would regain control of the South everywhere except where the British army stood.<sup>84</sup>

However, reinforcements were uncertain and the British War Ministry also realized that if Rawdon suffered further battle losses the British position in the South would be tenuous at best. Accordingly, an



exhausted Rawdon returned to Britian and the British withdrew their forces into a coastal district centering on Charleston and extending up the Santee River. The force consisted of approximately 2000 men and was commanded by Colonel Alexander Stewart.<sup>85</sup>

Greene conducted what in today's terminology would be called an operational pause during the early summer of 1731 in order to rest and replenish his force which had campaigned continuously since January. In August, he decided to challenge the British forces on the Santee and on 8 September he attacked at Eutaw Springs. The two armies were comparable in number and the Revolutionaries seemed to be finally gaining a tactical victory as they drove the British from the field. Unfortunately, when the Americans reached the British camp they began plundering whereupon Stewart counterattacked and retook the field.<sup>86</sup>

Eutaw Springs ended up being the final major battle of the campaign and concluded Greene's reconquest of the South. The Revolutionaries suffered over 500 casualties in the battle compared to nearly 700 for the British. These losses further diminished British strength and forced them to withdraw to the immediate vicinity of Charleston. This area, and the enclaves at Wilmington and Savannah, were the sole remaining possessions of the British in the South. To

force them from these strongholds, Greene would have to wait for reinforcements and await developments elsewhere. However, Greene had achieved his strategic and operational goals: he had defeated and driven the British from the countryside and wrestled control of the South from them. His campaign was undoubtedly one of the most impressive of the war, but was it operational art?

#### SECTION 4: CONCLUSIONS

FM 100-5 states that operational art requires broad vision, the ability to anticipate, and a careful understanding of the relationship of means to ends.<sup>87</sup> It explains that a commander conducting a defensive campaign defers decisive battles until he can win. Techniques to accomplish this are exhausting the enemy in protracted minor battles, withdrawing into friendly territory, and attacking lines of communications and bases of support.<sup>88</sup> It further explains that the focus at the operational level is the attainment of strategic aims through the design, organization, and conduct of campaigns and major operations while the focus at the tactical level is on winning battles and engagements.<sup>89</sup> Clearly, using these broad concepts, Greene operated at both levels during his campaign but mainly at the

operational level. This monograph has also demonstrated that Greene's campaign fits the theoretical frameworks developed by Schneider and Epstein for determining the practice of operational art. Therefore, Greene should be considered an early practitioner of that level of war.

He was able to conduct operational art mainly because he was forced to fight unconventionally. The meager resources available to him required that he adopt a less than conventional strategy. With only one main army, inferior to the British veterans, it is doubtful that he could have achieved his operational goals without dispersing his forces and conducting the distributed operations in the manner in which he did. Had he the inclination or the means to continually attempt the classical "strategy of a single point" he very likely would have suffered a fate similar to his predecessors and further degraded the Revolutionary cause in the South. Ostensibly, he attempted this strategy at Guilford's Court House but only after the proper conditions had been established. As it was, Greene's limited resources coupled with the dispersed British dispositions, necessitated that he conduct a distributed campaign with unconventional means.

Schneider labels Napoleon the undertaker of classical warfare for various reasons. He explains that

one reason is because during the Napoleonic era military units were concentrated in space and time on the battlefield which resulted in a more profound and immediate effect. The fates of empires could be decided in a single afternoon. Another reason was that the overriding requirement of control of classical armies demanded concentrated movement.<sup>90</sup> Clearly Greene did not--or possibly more accurately, could not--conduct this style of warfare.

Schneider notes that the new symmetry under the operational paradigm is characterized by the distribution of forces in a theater of operations rather than the concentration of forces as under the classical paradigm. Certainly, Greene's forces were distributed. Additionally, Schneider explains that the purpose of the classical defense was to gain time while the purpose of the operational defense is to exhaust.<sup>91</sup> Greene surely adhered to this concept, particularly against Cornwallis' army.

Greene's lack of any formal military education probably served as an asset rather than a detriment. Commanders steeped in military tradition more than likely would have sought the decisive "strategy of a single point", as had Greene's predecessors and his British opponents. Greene's lack of formal training and open mindedness enabled him to think the situation

through, weigh the alternatives, and develop a strategy unorthodox for that time.

Epstein equates the practice of modern war with operational art. Greene's campaign demonstrates that operational art as a distinct level of war was in existence prior to the emergence of modern war and that the two should not be considered synonymous. Most wars of the nineteenth century, including the Napoleonic Wars and the American Civil War, were undoubtedly much more modern than the American Revolution. The nineteenth century saw the commencement of nations waging wars with literally every resource of the state. Total mobilization and mass armies characterized by the nation at arms most assuredly began during the age of Napoleon and better equate to today's concept of modern war. Industrialization further modernized war later in the century.

Greene's main army at its largest (the Battle of Guilford Court House) consisted of only 4300 men, many of whom were undisciplined militia. Typical of most revolutions, the populace was divided in its loyalties. Many sided with the rebels, many sided with the British, and many remained apathetic. The colonies never truly became a nation at arms in the same context as the Napoleonic Wars or the American Civil War.

Schneider insists that some degree of

technological advancement is required for the practice of operational art. After outlining his structure of operational art, he lists seven necessary and sufficient contextual conditions which must exist in order for operational art to flourish and sustain itself. Each is causally linked to the Industrial Revolution.<sup>92</sup> However, as demonstrated by this monograph, Greene's campaign satisfies the attributes of Schneider's structure which could mean that Greene practiced operational art in its fullest expression. This leads one to conclude that although technology undoubtedly enhances a commander's ability to conduct operational art and certainly modernizes war, it is not a prerequisite to its practice.

As we have seen, Schneider's concept of operational art is much more narrowly defined than Epstein's. However, both are too narrow in their focus, probably due to their personal bias toward their particular subject expertise. Both base their theories strictly on conventional wars and fail to consider that the characteristics of unconventional wars may have similarities. As this monograph has demonstrated, the criteria developed by both can be applied elsewhere. Greene's campaign demonstrates that operational art existed prior to the time Epstein and Schneider conclude that it emerged. By necessity and design,

Nathanael Greene conducted an operational campaign and clearly was an early practitioner of operational art.

What, then, is the value in studying Epstein's and Schneider's theories or of studying history itself? The value is in learning the secrets of how to tie tactical means to strategic ends to accomplish the political objective. However, theories only provide another tool for the student to use when analyzing history. They are not the definitive words on the subject and should, therefore, be used with caution and a clear understanding of the potentially narrow definition they give to operational art. Instead, theories should be used to gain an understanding of the mental process required to practice operational art. Greene was probably not the first operational practitioner, although he was earlier than Schneider and Epstein would like to accept. Using their criteria helps clarify what today still retains a certain degree of mystery--the operational level of war.

Additionally, students of operational art can use Greene's campaign to gain insight into how to apply operational art to unconventional types of warfare. We very likely will be confronted with many such situations in the future. Studying Greene's campaign provides us clues for how to approach operational art across the spectrum of conflict.

## NOTES

1. Department of the Army, FM 100-5, Operations, (Washington D.C.: Headquarters, Department of the Army, 1986), p.10.
2. Ibid., p.29.
3. Ibid., pp.109,140.
4. Robert Epstein, "Eagles Triumphant: 1809 and the Emergence of Nineteenth Century Warfare", unpublished, 1992, p.4.
5. Ibid., p.6.
6. Robert Epstein, "The Different Levels of War in the Napoleonic Period--Austerlitz and Friedland", (Fort Leavenworth, KS: U.S. Army Command and General Staff College, AY 89/90), p.2.
7. Epstein, "Eagles Triumphant", p.8.
8. Ibid., p.7.
9. Ibid.
10. Ibid., p.8.
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12. Ibid., p.274.
13. Ibid., p.270.
14. Ibid., p.271.
15. Ibid., p.272.
16. Ibid., p.271.
17. Ibid., pp.272-3.
18. Robert Epstein, "Patterns of Change and Continuity in Nineteenth Century Warfare" (The Journal of Military History, July 1992), p.381.
19. Ibid., p.386.
20. Robert Epstein, "Course Commentary for AMSP Course 4: The Historical Practice of Operational Art", (Academic Year 1992-1993, School of Advanced Military Studies, Fort Leavenworth, 1992), p.3.



21. Ibid.
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23. Ibid.
24. Ibid., pp.3-4.
25. Ibid., p.5.
26. James Schneider, "Vulcan's Anvil: The American Civil War and the Emergence of Operational Art" (Theoretical Paper No. 4, School of Advanced Military Studies, Ft. Leavenworth, 1991) p.64.
27. Ibid.
28. Ibid., p.87.
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30. Ibid.
31. Ibid., p.22.
32. James Schneider, "The Loose Marble--and the Origins of Operational Art" (Parameters, March 1989), p.88.
33. Ibid., p.90.
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36. Ibid., p.32.
37. Ibid., p.64.
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39. Ibid., p.34.
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43. Schneider, "Vulcan's Anvil", p.38.
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52. Ibid., p.58.
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56. Ibid.
57. John Dederer, Making Bricks Without Straw: Nathanael Greene's Southern Campaign and Mao-Tse Tung's Mobile War, (Manhattan, Kansas: Sunflower University Press, 1983), p.34.
58. Schneider, "Vulcan's Anvil", p.58.
59. Don Higginbotham, The War of American Independence, (Boston: Northwestern University Press, 1972), p.365.
60. Weigley, p.29.
61. Edward Hoffer, "Operational Art and Insurgency War: Nathanael Greene's Campaign in the Carolinas", (MMAS Monograph, Fort Leavenworth, Kansas: School of Advanced Military Studies, 1988), p.18.
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63. Ibid., p.30.
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68. John Pancake, This Destructive War: The British Campaign in the Carolinas 1780-1782, (Alabama: The University of Alabama Press, 1985), p.129.
69. Weigley, p.29.
70. Pancake, p.139.
71. Weigley, p.32.
72. Ibid.
73. Hoffer, "Operational Art and Insurgency War: Nathanael Greene's Campaign in the Carolinas", pp.24-5.
74. Ibid., p.26.
75. Pancake, p.188.
76. Hoffer, p.28.
77. Weigley, p.33.
78. Higginbotham, p.372.
79. Weigley, p.33.
80. Higginbotham, p.373.
81. Weigley, p.33.
82. Ibid.
83. Ibid.
84. Ibid.
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86. Ibid.
87. FM 100-5, Operations, (1986), p.10.
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89. U.S. Army Training and Doctrine Command, FM 100-5, Operations (Preliminary Draft) (Fort Monroe, Virginia, Aug 1992), pp.1-4.

90. Schneider, "Vulcan's Anvil", pp.24-5.

91. James Schneider, "The Theory of Operational Art" (Theoretical Paper No.3, School of Advanced Military Studies, Ft. Leavenworth, 1988) p. 10.

92. Schneider, "Vulcan's Anvil", p.65. The seven necessary and sufficient conditions Schneider identifies are: 1. weapon lethality must have advanced beyond the technological stage of the smoothbore musket, 2. logistics must have advanced to the stage of supporting successive movement and sustainment, 3. signals technology must have advanced sufficiently to support instantaneous communications, 4. formations must be operationally durable, 5. the command structure must possess operational vision, 6. the enemy must be operationally minded, 7. nations must have a distributed capacity to wage war.

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